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HOW DO YOUTH WITH MENTAL DISORDERS FARE IN THE JUVENILE JUSTICE SYSTEM?

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ABSTRACT

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The purpose of this paper is to examine the relationship between mental health problems and justice outcomes. Several studies have documented that individuals with a variety of mental disorders are overrepresented in the justice system. This pattern could result if persons with mental disorders are more likely to commit crimes, or more likely to commit serious crimes, than persons without disorders. In addition, individuals with mental disorders may be more likely than those without disorders to be sanctioned conditional on committing a particular crime. The major public policy concern is around the latter possibility, which has been interpreted as the justice system being biased against those with mental disorders. In this paper we explore several channels through which mental health problems, measured as ADHD and depression, may lead to over-representation in the criminal justice system. Using a large sample of adolescents, our findings show that youth with ADHD fare worse in the juvenile justice system in terms of the probability of being arrested and the probability of conviction once arrested. We find that elevated ADHD symptoms during adolescence are associated with statistically significant and meaningful increases in the probability of arrest and conviction after controlling for preexisting factors and mechanisms that may arise from the disorder itself.

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1. Introduction

Rates of mental illness among incarcerated populations are more than twice as high as in the general U.S. population (Teplin, 1990; Robins and Regier, 1991). An estimated 10-16 percent of all individuals in the criminal justice system have a severe mental illness (Guy, et al 1985; Teplin 1990; Bureau of Justice Statistics, 1999), which corresponds to approximately 700,000 to 1.1 million severely mentally ill individuals across jails, prisons, and probation.[1] The fact that individuals with a variety of mental disorders are overrepresented in the justice system also has been documented in studies (Teplin et al, 2002; Wasserman, et al, 2002). How can such a pattern be explained? Are persons with mental disorders more likely to commit crimes, or more likely to commit serious crimes, than persons without disorders? Or are individuals with mental disorders more likely than those without disorders to be sanctioned conditional on committing a particular crime? The major public policy concern is around the last possibility, which has been interpreted as the justice system being biased against those with mental disorders (Massaro, 1999). Despite such concerns, there have been few systematic comparisons of persons with and without mental illness in the justice system, and almost no information is available about mechanisms that may lead from mental health problems to subsequent over-representation in the criminal justice system.

Understanding the mechanisms that may lead to over-representation of persons with mental illness in the criminal justice system is critical to inform public policy. If mental disorders affect the probability of committing crimes or the severity of criminality, and this is the main mechanism that leads to over-representation in the justice system, then policies related to mental heath treatment should focus on prevention of criminal behaviors. If bias is a primary

mechanism, in the sense that individuals with mental disorders are more likely to be sanctioned for a given crime or sanctioned more severely, then a concerted policy focus on changing the behaviors of key players in the justice and mental health systems is needed. This implies greater education of police, defense attorneys, prosecutors, probation officers and judges. It also implies a greater need for speedy access to mental health screening, treatment and information for those who become involved with the justice system.

This goal of this study is to examine the relationship between mental health problems and justice outcomes. This paper adds to the literature in several ways. First, we develop the plausible channels through which mental illness might affect justice outcomes. Conceptually, we draw parallels to the employment discrimination literature, where researchers have faced similar issues in assessing the impact of race or gender on labor market outcomes. Observed differences in justice outcomes that are not explained by differences in offending behavior and delinquency may reflect discrimination against those with mental health problems. This discrimination may be based on personal prejudice (Becker 1957, 1971), or the discrimination may be statistical in nature (Phelps 1972, Arrow 1973). In this application, statistical discrimination would imply that law enforcement officials, facing imperfect information about youths' delinquent behavior, rationally may use mental health symptoms as signals. For example, a police officer may be more likely to arrest a youth displaying psychiatric symptoms, after controlling for delinquency, since mental illness is associated with more violent criminal behavior (Brennan, et al, 2000; Swanson, et al 1990)

Differences in justice outcomes that are not explained by differences in delinquency, however, may result if mental health problems affect other characteristics associated with justice

[1] Based on rates of mental illness among inmates and probationers in 1998 (Bureau of Justice Statistics,1999) and applied to year-end 2004 data on inmates (Bureau of Justice Statistics, 2005) and probationers (Bureau of Justice

outcomes, such as academic outcomes, substance use, and family relationships. If such mediating factors, or mechanisms, are significant barriers to equitable treatment, then they ought to be addressed as a first step. Depending on the policy purpose we may be interested in the "full effect" of mental illness on justice outcomes, which would include differences that operate through these mechanisms, or the "partial effects" of mental illness, which would be calculated after holding constant differences that operate through mechanisms In this study, we estimate both full and partial effects of mental health problems, which provides some insight into the intermediate mechanisms that lead from these problems to justice outcomes.

A second contribution of this paper is our use of the National Longitudinal Study of Adolescent Health (Add Health), which includes data on a community sample of youth. Add Health offers several advantages over databases that have been used in prior research. First, it relies on data from a large, nationally representative sample of youth, which greatly increases the generalizability of our findings compared to previous studies. Second, youth in the sample are first interviewed in the community rather than in institutions, further avoiding problems of biased sampling criteria. Third, we can control for important variables that are not present in previous studies. These include the nature of the justice sanction, the youth's history of delinquency, mental health, and individual demographic and community variables. Fourth, our data are longitudinal, which allows us to explore mechanisms linking early mental health problems to subsequent justice outcomes.

Using a rich, longitudinal data source to sort out the contribution of preexisting factors and mechanisms is important to our understanding of whether and why juvenile justice disparities exist for youth with mental disorders and how to address them. Our results show that observable differences between youth with and without disorders can explain a large fraction of

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Statistics, 2006).

the gap in justice outcomes. Yet, a significant unexplained gap remains.

The paper proceeds in the following manner. Section I describes the previous literature. Section II discusses the unconditional gap in justice outcomes between youth with mental disorders and those without. It also addresses possible sources of observed disparities. Section III assesses how conditioning on different characteristics affects the estimated differences in arrests and convictions for ADHD. Section IV presents similar analysis for the impact of chronic depression. Section V decomposes the observed differences in arrest and conviction probabilities. Section VI concludes with a discussion of our evidence.

2. Previous Literature

Previous studies have documented a high prevalence of mental disorders among youth (Teplin et al, 2002; Duclos, et al, 1998; Timmons-Mitchell, et al 1997; Wasserman, et al, 2002) and adults (Teplin, 1990) in the justice system. These studies find that the rate of disorder is typically higher than those found in community studies (see Shaffer, et al 1996). It may be tempting to interpret these data to say that the justice system is biased against persons with mental disorders, but such an interpretation should be made with caution. Aside from their small sample sizes, these studies also have design limitations that limit our ability to assess whether individuals with mental disorders are sanctioned more heavily than others for the same crimes.

Many of these studies assess youth for mental disorders in a particular justice setting, such as in detention facilities (where cases typically have not been adjudicated or "tried" and stays are relatively short) or in commitment facilities (where youth have been found delinquent or "guilty" and are serving their punishment). Incarcerated youth are a relatively small subset of all justice-involved youth; thus, the studies provide only a narrow view of the juvenile justice system. The prevalence of disorder across these studies varies considerably, in part because the

likelihood of any youth being arrested or otherwise involved in the justice system varies geographically. For example, Duclos et al (1998; 2003) found a relatively low prevalence of mental disorders in an area where incarceration rates of youth were generally quite high. In other words, the broader the involvement of youth in juvenile justice, the more the justice sample resembles a community sample. Studies restricted to youth in commitment facilities are further difficult to interpret because youth with shorter sentences leave more quickly, leading to oversampling of long-stay youth. Similar issues exist in studies of adult inmates in jails, which confine individuals for short periods, and in prisons, which typically confine inmates guilty of felony offenses and sentenced to more than a year. Importantly, these studies also typically do not control for demographic characteristics or offending behaviors.

Other studies have found that prisoners with mental illness are more likely to be arrested and to serve longer sentences than prisoners without mental illness (Teplin, 1984; Hochstedler, 1987; Ditton, 1999). Ditton (1999), in a federal survey of mental illness among inmates, found that state prison inmates with mental illness were sentenced to serve an average of 12 months longer than other inmates. On the other hand among jail inmates, the findings were reversed: the average maximum sentence was 6 months shorter among those with mental illness than those without. Studies of inmates also find that those with mental illness are more likely than others to be involved in fights and break more rules (Bureau of Justice Statistics, 1999). One difficulty with inmate surveys, as mentioned previously, is that they overrepresent long-stay individuals relative to short-stay individuals and this may be confounded with mental illness.

Another study compared individual court cases involving mentally ill defendants with aggregate population-level data on court cases (Hochstedler, 1987). Although the study finds that those with mental illness were more likely to receive probation or imprisonment, rather than

fines or dismissal, this study could control only for broad differences in the offense for which the individual was charged (i.e., felony vs. misdemeanor offenses) which is discretionary. The study is not able to control for actual offending behavior, prior level of criminal activity, or demographics.

Teplin (1984) undertakes a qualitative study of policy-citizen encounters and tests for differences in arrest rates controlling for visible signs of mental disorder. The degree to which the police behavior was affected by researchers' observation of the encounters is not known. The study is narrowly focused on the role of visible symptoms of severe mental illness such as bizarre speech, confusion/disorientation, or paranoia. Among its limitations are the fact that it is able to study only two urban precincts in a single city in 1980/81. Furthermore, the study is limited to the probability of arrest among 500 citizens considered "suspects" by the police, 30 of whom were considered mentally disordered. The labeling of suspects, however, is discretionary and itself endogenous. The study finds that, controlling for offense type, the arrest rate is higher among those exhibited signs of mental disorder than those who did not. The study is unable to control for other characteristics.

The existing literature ultimately does not answer the key question of what would have happened to those with mental illness in the justice system had they not had mental illness. The complication is that, in addition to affecting delinquency, mental illness may affect the distributions of other characteristics associated with justice outcomes. Depending on the policy purpose we may be interested in the full effect of mental illness, including these other differences, or the partial effect, net of some differences. In the next section we focus on youth with mental illness, because it matches our empirical approach, but similar arguments can be made for adults.

3. The Full Effect of Mental Illness on Justice Outcomes

There are many points in the juvenile justice system at which discretionary decisions are made which may lead to disparate outcomes for youth. These include the decision by police to arrest youth rather than send them home or otherwise serve a warning; the court intake step at which an offense is recorded; the decision to detain a youth in a formal facility to await further case processing, rather than have them wait in a community setting; the decision by the probation officer or prosecutor to formally or informally pursue a case; the decision by the judge to adjudicate the youth as delinquent or not (i.e., find them guilty or not); and finally the degree of the sanction, such as confining the youth in a commitment facility or having them perform community service.

One challenge is sorting out the channels through which mental illness affects justice outcomes. Similar challenges are faced in the employment discrimination literature that assesses the impact of race on labor market outcomes. We draw the following analogy. In the labor market literature, observed differences in wages across racial groups may be explained by discrimination, meaning minority workers with the same ability and training receive lower wages. The observed wage differences may also be explained by minorities having less ability and training which leads to lower rewards. As Carneiro et al (2005) point out, the policy implications are profoundly different. In addition, if discrimination or expectations of discrimination contribute to some dimensions of lower ability and training of minorities, then these factors are proxies for discrimination and should not be included as control variables when testing for wage differences across racial groups (Neil and Johnson, 1996; Carneiro, Heckman, Masterov, 2005). This is true to the extent one wants to know the "full effect" of discrimination through all channels.

Whereas the employment discrimination literature focuses on whether wage differences arise from discrimination, from discrimination's role in acquiring abilities, or from differences in abilities unrelated to discrimination, we focus on observed differences in justice outcomes for persons with mental illness. The empirical goal of the paper is to determine whether youth with mental illness, measured as elevated symptoms of ADHD and depression, experience worse outcomes in the juvenile justice system compared to youth without these problems.

Our data come from the Add Health, a nationally representative study of adolescents living in the community which surveys youth regarding delinquent behavior and justice sanctions as well as mental disorders. Add Health surveyed all students in grades 7 through 12 in a pair of schools in each of 80 communities in the United States. In 1994 and 1996, two waves of the survey were conducted, with data collected at the individual, family, school, and community level. Respondents were then re-interviewed as young adults in a third wave of the survey conducted in 2001 and 2002. We included only youth who responded to the in-home survey in all three waves (1994, 1996, and 2001). Our sample size is 9,201 youth.

Juvenile Justice Outcomes. As outcome variables, we consider two measures of justice system response to youth delinquency. For all youth, we measure whether a youth was ever arrested prior to age 19. Additionally, among those ever arrested, we measure whether the youth was ever convicted prior to age 19 in juvenile court. Youth who are incarcerated during the Wave III interview are not observed.

Mental Health. As the primary covariate of interest, we focus on two types of mental health problems that are highly prevalent among adolescents: Attention Deficit and Hyperactivity Disorder (ADHD) and depression. To measure symptoms of ADHD, we use the 18-item Retrospective Attention Deficit Hyperactivity Scale from Wave 3. This scale requires

respondents to report on the frequency of behaviors such as impulsiveness, inattention, disorganization, and hyperactivity between the ages of 5 and 12 We define youth as having elevated ADHD symptoms if they were at the 75th percentile of the sample distribution or higher in terms of their self-reported symptoms. To measure depression**,** we use the modified Center for Epidemiologic Scale for Depression (CES-D) used in waves 1 and 2. We identify youth as having chronic, elevated depressive symptoms if their average score in both waves ranks at the 75th percentile or higher of the sample distribution for depressive symptoms.

Since Add Health does not include formal diagnostic interviews for mental disorders, neither the ADHD nor the depression measures are diagnostic assessments per se. Our measures are broad in the sense that they capture adolescents who would meet diagnostic criteria for these disorders, as well as adolescents with sub-threshold disorders and no disorders. Consequently, we assess the effect of elevated symptoms, rather than diagnosis. Youth who are being treated for their conditions will thus have lower symptoms.

Table 1 describes rates of justice outcomes by mental health disorder. It shows that youth who had ADHD were more likely to be arrested prior to age 19 than other youth (7.6 percent vs. 3.9 percent). Among those arrested, youth with ADHD were more likely to be convicted (50.6 vs. 37.8 percent). Similarly, youth with depression were more likely than other youth to be arrested (5.7 percent vs. 5.0 percent). Among those with depression who were arrested, the likelihood of conviction was greater (48.1 percent vs. 42.3 percent).

3. Decomposing the Gap in Justice Outcomes.

Differential response to youth with mental disorders could arise from multiple mechanisms operative in the justice system. One is simple prejudice, or beliefs and stereotypes by prosecutors, probation officers, defense attorneys and judges that reflect unjustified negative

attitudes based on a person's group membership (Dovidio, et al 1996). Some have argued, for example, that antisocial behavior among African Americans is viewed as delinquent, whereas similar behavior among Whites is attributed to a mental illness (Campbell, 1998; Bridges and Steen, 1998). This would affect perceptions of culpability and choices of punishment. Similarly, individuals with mental disorders may exhibit behavior that exacerbates perceptions of their delinquency, for example, by exhibiting less remorse or by being inattentive or hostile. Disrespectful and hostile behavior has been found to be associated with higher likelihood of arrest (Novak and Engel, 2005). Being remorseless, inattentive or hostile during case processing is likely to increase the chances of conviction. Thus, the justice system may be reacting to symptoms of mental illness, rather than the presence of the illness itself.

In addition to true prejudice and intolerance for those displaying symptoms of mental illness, statistical discrimination also may result if there is uncertainty about whether punitive or rehabilitative justice approaches are more likely to succeed and reduce recidivism for youth with mental disorders. Such uncertainty may lead to unequal application of justice approaches, leading one to observe more punitive approaches for one group than the other. Another possible mechanism is that incarceration is viewed as an alternative to mental health treatment, particularly in geographic areas where supply of health care services is low or in circumstances where involuntary heath care treatment is difficult to impose (Wexler, 1983); however, this avenue into the justice system would only be relevant for those with mental illness.

Finally, there are a number of covariates correlated with mental illness that may partially explain its effect on justice outcomes. Some of these covariates are preexisting characteristics, such as race and gender, that may confound an observed association between psychiatric symptoms and justice outcomes. Other covariates, such as academic outcomes and family

relationships, are of interest as mechanisms, as they are factors that may link mental illness to justice outcomes. In the following sections, we evaluate the effects of preexisting characteristics and mechanisms by estimating the model below:

$$J = \alpha_1 MH + \alpha_2 \mathbf{X} + \alpha_3 \mathbf{C} + \alpha_4 \mathbf{D} + \alpha_5 \mathbf{S} + \alpha_6 \mathbf{A} + \alpha_7 \mathbf{F} + \varepsilon \quad (1)$$

In Equation (1), juvenile justice outcome (J) is a function of a measure of mental health (MH), standard demographic variables including gender and race (**X**), community characteristics (**C**), delinquency history (**D**), substance use (**S**), school outcomes (**A**), and family relationship characteristics, (**F**). Construction and interpretation of these variables is described in detail below. To estimate Equation 1, we use logistic models and include the two mental health variables (ADHD, depression) separately because these variables are highly collinear. We start with a specification that includes only the mental health measure on the right hand side. We then incrementally add each set of covariates (X, C, D, S, A, F) to the model and gauge how the addition of each set of variables affects the magnitude and statistical significance of the coefficient on the mental health measure. The demographic and community variables which are added first (X and C) are considered preexisting factors, while delinquency, school outcomes, substance use, and family relationships (D, S, A, F) are of interest as mechanisms. If the mental health coefficient is still a statistically significant predictor of justice outcomes, even after all the preexisting factors and mechanisms have been added to the model, we would interpret this coefficient as capturing the effects of discrimination towards youth with mental health problems, as well as the effects of any unobserved heterogeneity or unmeasured mechanisms.

Table 3 summarizes findings from logistic models which focus on the effect of ADHD symptoms on justice outcomes. Models are estimated using a combined gender sample as well as a males only sample (we do not show findings for a females only sample because the sample

size of arrested females is too small to analyze convictions). Panel A in Table 3 shows the models with arrested before age 19 as the dependent variable, while Panel B shows the models with conviction before age 19 as the dependent variable. Each column in Table 3 represents a successively richer model in which we add additional covariates. Each cell shows the estimated coefficient of a binary indicator for ADHD symptoms and is from a separate regression. Table 4 shows similar results from models in which the effect of depressive symptoms on justice outcomes is of interest. Here, too, each cell is from a separate regression. Full regression results are shown in the appendices.

3.1 The Role of Demographic Characteristics

Observed differences in arrest rates could arise not only from differences in delinquent behavior and academic performance but also from the correlation between mental disorder and other sociodemographic factors that influence justice outcomes. For example, the prevalence of mental illness differs by gender. The clinical literature finds that males are more likely to be diagnosed with ADHD than females, but less likely to be diagnosed with depression (USDHHS, 1999). At the same time arrest is more likely for males. Consistent with the clinical literature we find in our sample that youth with ADHD are more likely to be male (59 percent) than youth with depression (40 percent) or youth with neither disorder (49 percent).

Prior literature also shows that mental illness is correlated with low income (Glied, et al 1997) which, in turn, may affect the quality of a person's legal representation. We proxy family income by measuring whether or not the mother completed less than high school or high school and with whether either the mother or father received welfare assistance. We also control for whether the youth lived with two parents. In our sample youth with ADHD or depression are somewhat more likely to be from lower income families. Sixty percent in both groups had a

mother with high school education or less, compared to 56 for youth with neither disorder. Rates of welfare receipt were similar with 13 percent reporting welfare among youth with ADHD, compared to 14 percent among youth with depression and 11 for youth with no disorder.

Race and ethnicity also are correlated with mental illness. Data from the National Comorbidity Survey-Replication show that lifetime prevalence of mental disorders is lower among Hispanics and non-Hispanic Blacks and that the lower risk of disorder begins in childhood (Breslau, et al 2005). At the same time, there is evidence that minorities are overrepresented in the U.S. justice system (OJJDP, 2004). Minorities represented approximately one third of youth in 1997, but two thirds of youth incarcerated in detention or commitment facilities. Further, studies find minorities are overrepresented at each stage of case processing and that these differences persist after controlling for severity of crime and prior rates offenses. Consequently, minority status in the mental health context is a protective factor for justice outcomes.

In our first specification, we estimate the association between ADHD and justice outcomes with no other covariates included (Table 3A, Column 1). From this model, estimated with the combined gender sample, we see that high levels of ADHD symptoms are associated with a 3.7 percentage point increase in the probability of arrest, which is about a 71 percent increase at the sample mean arrest rate of 5.2 percent. In the males only sample (Table 3B, Column 1), high levels of ADHD symptoms are associated with a 49 percent increase in the probability of arrest measured at the sample mean arrest rate for males. Among individuals who have been arrested, ADHD is associated with a 12.6 percentage point increase in the probability of conviction, which is a 28 percent increase at the sample mean conviction rate of 44.5 percent. Similarly, in the males only sample, ADHD is associated with a 29 percent increase in the

likelihood of conviction at the sample mean for males.

To see whether these effects change appreciably as we add preexisting characteristics to the model, we begin by including gender in the model (Table 3A, column 2). When gender is included, the coefficient on ADHD declines sharply, although it remains positive and statistically significant. The marginal effect of ADHD declines from 3.7 percentage points to 1.9 percentage points. In the model with conviction as the dependent variable, the coefficient on ADHD also declines when gender is added to the mode. The marginal effect declines by roughly one percentage point, from 12.6 percent to 11.5 percent.

Including the other demographic variables to the model (column 3) has virtually no impact on the coefficients for ADHD either in the arrest or in the conviction models. Coefficients on the demographic variables are shown in Appendix 1 (arrest) and Appendix 2 (conviction). While having two parents in the household is associated with a decline in the probability of arrest, race, welfare receipt and mother's education have little independent effect on justice outcomes. The probability of arrest increases with age, but at a declining rate. Age also increases the probability of conviction. We run separate models for males and find similar results.

3.2 Community Characteristics

In this section we address the role of community influences. The literature on crime finds after controlling for individual factors, residence in underclass neighborhoods is significantly associated with delinquent behavior (Peeples and Loeber, 1994). In addition, although urban residence does not appear to be an independent risk factor for mental disorder for adults (Judd et al, 2002), among adolescents, urban residence is associated with more conflict and externalizing behaviors (Elgar et al., 2003a) and higher levels of behavioral and substance use problems

among juveniles (Elgar et al., 2003b). The stability, or perceived stability, of the local environment may also influence whether youth are returned to their homes conditional on delinquent behavior.

We control for several measures of community influences measured at the level of the Census tract, including median housing value, percent of households with income below poverty and its square, and urbanicity.[2] Some of these measures, for example median income, may also proxy for family characteristics. In our sample, we find very small differences in community characteristics across the three groups of youth (Table 2). In Table 3A, column 3, we show that controlling for observed community characteristics has little effect on the estimated effect of ADHD on arrest. The effect of neighborhood characteristics on conviction, however, is more pronounced. After including community characteristics in the model, the marginal effect of having ADHD on the likelihood of being convicted increases from 11.7 to 15.9 percentage points. For males (Table 3B, column 3), the marginal effect increases from 13.3 to 17.5 percentage points.

3.3 The Role of Delinquent Behavior

We now move from examining the effects of confounding, preexisting characteristics to considering potentially important mechanisms in the relationship between ADHD and justice outcomes. One obvious explanation for the high prevalence of mental disorder in the criminal justice system is that mental disorders in adolescents may manifest themselves in inappropriate or unlawful conduct (Fabrega, Ulrich and Loeber, 1996; Rawal, et al 2004). Certain mental disorders, such as hyperactivity and depression, are associated with higher rates of delinquent behavior, not just higher rates of arrest (Barkley, Fischer, Smallish, Fletcher, 2004). Youth with ADHD, for example, experience peer rejection and engage in numerous disruptive behaviors

(NIH 2000); their increased impulsivity also has been found to lead to greater initiation of fights (Halperin et al. 1995). For persons with depression a sense of hopelessness and lack of future orientation may lead them to discount future consequences and be more likely to commit crimes. Juveniles also are more apt than adults to act out their depression through disruptive and aggressive behaviors (Bleiberg, 1991). Problems with social functioning and peer relations can make juveniles with depression more prone to delinquent behavior and aggression (Brimaher, et al, 1998).

Delinquency is measured as the reported frequency of a given activity in the past 12 months.[3] The frequency is summed across 8 separate activities in each wave and we take an average. We include both a linear and squared term for delinquent acts. Separately, we sum the number of violent acts reported in the past 12 months each wave and take an average.[4] We also create indicators for whether the youth reported a nonminor theft[5] or selling or possession illegal drugs in each wave and take averages for both.

Youth with mental disorders were more likely to report high levels of delinquency. Table 2 shows that all youth reported 2.6 delinquent acts on average across both waves, compared to 3.0 for youth with ADHD and 3.4 for youth with depression. The average number of violent acts was 0.8 for all youth, 1.1 for youth with ADHD and 1.1 for youth with depression. Similarly, the 0.12 of all youth reported nonminor theft and sale/possession of drugs respectively, compared to

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[2] We impute missing values.

[3] The reported activities: "How often did you paint graffiti on signs on someone else's property or in a public place; deliberately damage property that didn't belong to you, it to your parents or guardians about where you had been or whom you were with; take something from store without paying for it; run away from home; drive a car without the owner's permission; steal something worth less than $50; and act loud, rowdy, or unruly in a public place.

[4] For each wave we assigned a one if youth reported having done any of the following in the past 12 months: get into a serious physical fight; hurt someone badly enough to need bandages or care from a doctor; use or threaten to use a weapon to get something from someone; take part in a fight where a group of your friends was against another group; pulled a knife or gun on someone; shot or stabbed someone. We then sum each youth's responses across waves, resulting in a composite variable has possible values of 0, 1 or 2.

[5] We define nonminor theft as stealing more than $50 or going into a house/building to steal in the past 12 months.

16 percent and 17 percent for youth with ADHD and 18 percent for youth with depression.

In Table 3, column 5 we include the measures of delinquent behavior. We find that the effect of ADHD remains positive and significant after controlling for delinquency, although as expected the coefficient on ADHD drops considerably after the inclusion of the delinquency covariates. The marginal effect declines from 1.6 percent to 0.8 percent in the full sample and from 3.9 percent to 2.1 percent in our sample of males only. Adding delinquency measures also has a substantial effect in the conviction models. Here the marginal effect of ADHD declines from 7.1 percent to 5.8 percent in the full model (17.5 percent to 14.4 percent for males only). These findings indicate that after controlling for demographic and community characteristics as well as delinquency, youth with high levels of ADHD symptoms still fare appreciably worse than youth without high levels of ADHD symptoms in the justice system.

3.4 The Role of Substance Use

In this section, we focus on substance use. Previous research suggests that psychiatric disorders, including ADHD, anxiety and depression, are strong correlates of substance use (Kandel, et al 1997; Pulkkinen & Pitkanen 1994, Caspi et al. 1996, Block et al. 1988, Boyle & Offord 1991, Deykin et al. 1987, Deykin et al. 1992). Because alcohol and illicit drug use among minors is by law a punishable offense, this correlation between mental illness and substance use may be an important contributor to observed differences in arrest rates.

Following a large body of previous research, our adolescent substance use measures are continuous measures capturing binge drinking, the frequency of alcohol use, and the frequency of illicit drug use (Dee & Evans, 2003; DiNardo & Lemieux, 2001; Rees et al., 2001; Kenkel & Ribar, 1994; Farrelly et al., 2001; Guillamo-Ramos et al., 2005; Swahn et al., 2004; Lundborg,

2002 and others).[6] For frequency of alcohol use we calculate the number of days on which the youth drank alcohol in the past year in wave I and wave II and create an average.[7] For frequency of binge drinking we identified chronic, frequent drinkers who report binge drinking in both wave I and wave II. Our indicator is equal to one if in both waves the youth reported report having binged (i..e., having had 5 or more drinks on one occasion) on 2 or more days in the past month. Our illicit drug use measures focus on marijuana use, since this drug is the most commonly used in our sample. Marijuana use is measured as the number of times over the past month and we take the average response for both waves. For categorical responses to survey questions on alcohol and drug use, we use the midpoints of the categories to create continuous measures of frequency of use.

Our data on mental illness and substance use are consistent with the prior literature. For youth with neither disorder the average frequency of drinking alcohol drinks was 15.2 days, compared to 19.1 days for youth with ADHD and 20.8 days for youth with depression. The average proportion reporting binge drinking was 8 percent for youth with neither disorder, 11 percent for youth with ADHD, and 12 percent for youth with depression. Finally, average marijuana frequency was 1.9 for youth with no disorder, 2.6 for youth with ADHD and 2.8 for youth with depression.

Table 3, column 6 shows the effect of including substance use measures. When the measures of binge drinking, alcohol frequency, and marijuana use are included, the coefficients on ADHD change only modestly in both the arrest and the conviction models. Frequency of alcohol use increases the likelihood of arrest, but not of conviction (see Appendix 1 and 2).

[6] As is the case for our measures of ADHD and depression symptoms, respondents who drink heavily may or may not meet diagnostic criteria for substance use disorders.

Controlling for alcohol frequency, binge drinking has a small negative effect on arrest and no statistically significant effect on conviction. Marijuana frequency does not affect the probability of arrest, but it is associated with an increased likelihood of conviction.

3.5 Academic Performance

Another mechanism through which mental illness may affect justice outcomes arises from academic performance. Youth with certain mental disorders have more trouble in school and develop poor academic performance relative to other youth. For example, youth with major depression for example have lower grade point averages and more suspensions than other youth (Marmorstein and Iacono, 2003). This relative poor academic performance may be a direct consequence of the mental health symptoms experienced by the youth. A youth with poor academic performance also may be perceived as more severely delinquent or more likely to recidivate than another youth. Poor academic performance, thus, may affect the willingness of the justice system to process a case informally (e.g., by not arresting or charging the youth) and the degree of any sanction assessed. Since grades, in particular, are not observable to an arresting officer we include this variable only in the conviction models.

We use two measures of academic performance. First, we use an average grade point average based on youth reported grades in math and English in wave I and wave II. We also average how many days the youth reported being absent from school with no excuse across wave I and wave II. Absolute differences in unexcused absences were relatively small across groups, however, youth in the full sample had fewer unexcused absences (1.3) than youth with ADHD (1.6) and youth with depression (1.6). Column 7 in Tables 3 shows including school performance reduces the magnitude and statistical significance of the ADHD coefficient in the

[7] In waves 1 and 2, respondents provide information regarding the number of days on which the youth drank alcohol in the past 12 months and regarding the number of drinks per occasion. We multiply these responses to create a

arrest model (both in the combined gender and male only samples), suggesting that these outcomes may be a mechanism linking psychiatric symptoms to justice outcomes. In the conviction models, however, the magnitude and statistical significance of the ADHD coefficient actually increases with the addition of school outcomes. This finding is counterintuitive, as youth with elevated ADHD symptoms have worse schooling outcomes and a higher probability of conviction compared to youth without elevated ADHD symptoms.

3.6 Parent Relationships

The strength of a youth's relationship with their parents may proxy for whether the parents would take an active role in the event the youth is picked up by the police following a delinquent act. To include two measures of the parent-youth relationship. One is a parent–adolescent activities composite which reflects the number of shared parent-child activities within the past 4 weeks (averaged over wave I and wave II reports). This measure was based on an item in which adolescents reported involvement in up to 10 activities with a parent.[8] Activities are asked of mother and father separately. We included the activity in our count if it was reported for either mother or father. In addition we include a measure of parent-child closeness. We sum responses to five questions on a 5-point scale that measures how close adolescents' feel to their mother and how much they believe their mother cares about them.[9] We then average the response across both waves. A low score indicates a closer relationship. We include an

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measure of total drinks in the past year.

[8] Youth were asked about having done the following in the past four weeks: have you gone shopping? Have you played a sport? Have you gone to a religious services or a church-related event? Have you talked about someone you're dating or a party you went to? Have you gone to a movie, play, museum, concert, or sports event? Have you had a talk about a personal problem you were having? Have you had a serious argument about your behavior? Have you talked about your school work or grades Have you worked on a project for school? Have you talked about other things you're doing in school?

[9] Youth responded that on a scale of 1 to 5 (1 being strongly agree and 5 being strongly disagree) to the following statements: Most of the time your mother is warm and loving toward you. Your mother encourages you to be independent. When you do something wrong that is important, your mother talks about it with you and helps you

indicator if there is no resident mother.

Youth report relatively small differences in parent relationships across disorders. Those with neither ADHD nor depression had mean parental relationship scores of 8.5 compared to 8.6 for youth with ADHD and 9.0 for youth with depression. The number of joint activities with a parent was virtually the same across groups (2.6 for youth with ADHD or no disorder and 2.8 for youth with depression). Our multivariate regression results show that the coefficient on ADHD does not change much with the inclusion parental relationship measures in either the arrest or the conviction models.

IV. Chronic Depression

Table 4 has the same layout as Table 3, but shows the estimated coefficients of the binary indicator for chronic depression. In the most basic model, depression appears to have a positive, but not statistically significant effect on arrest. Once we add gender to the model (in the combined gender sample), the estimated coefficient for depression then becomes positive and statistically significant. The addition of other preexisting factors has little effect on the depression coefficient. However, once we add delinquency as a mechanism, the effect of depression becomes zero and not statistically significant. Adding additional mechanisms, such as substance use, school performance and parental relationships does not change this effect. Thus, the effect of depression on arrest can be explained by the higher rates of delinquency among depressed individuals. The results also hold for our sample of males. In our models of conviction, we find that depression has a positive effect on conviction in all models, but the effect is not statistically significant. This is also true in the model estimated with males only.

V. Oaxaca Blinder Decomposition of Arrest and Conviction Rates.

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understand why it is wrong. You are satisfied with the way your mother and you communicate with each other. Overall, you are satisfied with your relationship with your mother.

In this section, we examine the proportion of the total gap in justice outcomes that can be explained by observable characteristics following Oaxaca (1973) and Blinder (1973). In our application this method involves estimating separate justice outcome equations for two groups (e.g. those with a mental disorder and those without) and decomposing the estimated differential in outcomes between the groups into two components: (1) a component that can be explained by differences in the distributions of observed characteristics (e.g. differences in delinquency); and (2) a component that can be attributed to the structure of the model (e.g. differences in the coefficients on delinquency for the two groups and differences in unobservable endowments). We quantify the contribution to group differences in outcomes from all measured characteristics, i.e., delinquency, substance use, school performance, parent relationships, demographics and community characteristics.

The decomposition for a nonlinear equation, $Y = F(X\hat{\beta})$, can be written as (Fairlie, 1999):

$$\bar{Y}^A - \bar{Y}^B = \left[\sum_{i=1}^{N^A} \frac{F(X_i^A \hat{\beta}^A)}{N^A} - \sum_{i=1}^{N^B} \frac{F(X_i^B \hat{\beta}^A)}{N^B}\right] + \left[\sum_{i=1}^{N^B} \frac{F(X_i^B \hat{\beta}^A)}{N^B} - \sum_{i=1}^{N^B} \frac{F(X_i^B \hat{\beta}^B)}{N^B}\right] \quad (2)$$

where *A* denotes the group of youth with a mental disorder, *B* denotes the group of youth without, and *N* denotes the sample size for group *j*. The first term captures the part of the gap in outcomes that is due to group differences in the distribution of *X*. This equation assumes that the group with a mental disorder represents the appropriate baseline. Equally valid is a specification that assumes that the group *B*, those without the mental disorder, constitutes the appropriate baseline in which case $\hat{\beta}^B$ would be used as weights in the first part of the decomposition. In fact, any combination of $\hat{\beta}^A$ and $\hat{\beta}^B$ could be used as weights (Ransom and Oaxaca, 1994). For this analysis we compose the gap in justice outcomes using coefficient estimates from the pooled

sample of groups A and B.

The results in Table 5 confirm that most of the gap in justice outcomes for youth with ADHD is due to differences in observable characteristics. The explained portion of the arrest gap is 68 percent for ADHD among all youth. For convictions the explained portion of the ADHD gap is lower, 38 percent for the full sample. For depression observables explain a higher portion of the gap. For convictions, the observable covariates explain 71 percent of the gap for the full sample. Table 5 also underscores the previous findings on arrests that selection on observables favors youth with depression. Results for the male only sample are qualitatively similar.

VI. Discussion and Conclusion

Using a large sample of adolescents, our findings show that youth with some mental disorders fare worse in the juvenile justice system in terms of the probability of being arrested and the probability of conviction once arrested. Our models control for most likely correlates of mental disorders and juvenile justice outcomes. We find that elevated ADHD symptoms during adolescence are associated with statistically significant and meaningful increases in the probability of arrest and conviction after controlling for preexisting factors and mechanisms.

We examined factors, such as demographics and community characteristics that in most cases preexist the youth's mental illness. An important preexisting factor is gender, as males fare worse in terms of justice outcomes than females. Among mechanisms that may arise from the ADHD disorder itself, delinquency accounts for a significant fraction of the observed difference in arrest rates between those with and without ADHD. School performance and parental relationships play a lesser role.

For depression we did not find a disparity in arrests rates. In fact, conditional on

preexisting factors and mechanism, such as delinquency, substance use, and academic performance, youth with depression appeared to have a lower probability of arrest than those without. Depression is an "internalizing disorder" which is often not readily detected by observers.

Our study has several important limitations. First, it is limited by the fact that the measurement of mental disorders is based on symptom scales rather than on a diagnostic assessment tool. Symptoms, however, are likely to be what is observed by agents of the justice system. At the time of conviction it is possible that diagnostic information becomes available. Our measures of justice sanctions rely on youth's recall of these events, and were not independently confirmed with administrative records from the police or juvenile justice records. Similarly, delinquent behaviors are self-reported and we can not rule out that the delinquent behaviors of youth with mental illness are different from the behaviors of other youth in subtle ways. Furthermore, we estimate an average effect of each disorder, but this may mask large differences across jurisdictions.

This study is able to control for important individual and area characteristics that are lacking in previous studies, but which may otherwise confound the relationship between mental health and justice contact. Despite the richness of the data there may be dimensions of the crime or sanction that are unobserved to us and that are correlated with the youth's disorder leading to biased regression results. Such unobserved characteristics could be aspects of the crime committed (e.g., degree of violence) or of the youth's attitude (e.g., remorse exhibited or disrespectful behavior). In addition, since we measure delinquency and intermediate mechanisms at the same time, the possibility of structural endogeneity remains (e.g. academic performance leading to depressive symptoms instead of or in addition to the other way around).

However, in the end, this limitation is less relevant since these mechanisms did not prove to be important empirically. Despite these limitations this study offers important advantages over existing research and enables us to address directly the question of whether youth with mental disorders are sanctioned disproportionately by the justice system.

Results of this study will have important implications for identifying a group of youth whose health needs are not being appropriately recognized and who face a greater likelihood of being punished as a result of their disorder. Bias in the justice system may reflect a lack of understanding that untreated mental disorders can exacerbate the propensity to engage in delinquent behavior. Careful consideration of a youth's mental disorders could lead to more appropriate referral of delinquent youth to community treatment services and the expansion of the public mental health system. Recognizing the needs of youth with mental disorders, the justice system may also develop more appropriate sanctions that include treatment components. With appropriate assistance, youth with mental disorders who are serving sentences, such as probation, may more successfully comply with the terms of probation and not face additional sanctioning. Ultimately, this study has implications for education programs in the justice system, as well as the delivery system of public mental health services.

References

Barkley RA, Fischer M, Smallish L, Fletcher K (2004) Young adult Follow-up of Hyperactive Children: Antisocial Activities and Drug Use. *Journal of Child Psychology and Psychiatry* 45(2):195-211.

Barsky, R, Bound J, Kerwin KC, Lupton J, (2002) "Accounting for the Black-White Wealth Gap: A Nonparametric Approach," *Journal of the American Statistical Association* 97(459): 663-673

Bearman, PS, Jones J, Udry, JR. The National Longitudinal Survey of Adolescent Health: Research Design (online). Available at http://ww.cpc.unc.edu/projects/addhealth/design.html.

Block, J. et al. (1988). Longitudinally foretelling drug usage in adolescence: Early childhood personality and environmental precursors. *Child Development*, 59, 336-355.

Breslau J, Aguilar-Baxiola S, Kendler KS, Su M, et al (2005) "Specifying Race-Ethnic Differences in Risk for Psychiatric Disorder in a USA National Sample," *Psychological Medicine* 35:1-12

Boyle, M.H. & Offord, D.R. (1991). Psychiatric disorder and substance use in adolescence. *Canadian Journal of Psychiatry*, 36, 699-705.

Brennan PA, Mednick SA, Hodgins S. (2000). Major mental disorders and criminal violence in a danish birth cohort. *Archives of General Psychiatry* 57:494-500.

Bridges, GS and Steen, S (1998). Racial Disparities in Official Assessments of Juvenile Offenders: Attributional Stereotypes as Mediating Mechanisms. *American Sociological Review* 63:916-923.

Bureau of Justice Statistics, Department of Justice (1999), *Mental Health and Treatment in*

Inmates and Probationers Publication Number NCJ174463, (Washington, DC: USDOJ)

Bureau of Justice Statistics, Department of Justice (2005) "Probation and Parole in the United States, 2004" Publication Number NCJ 210676 accessed at www.ojp.usdoj.gov/bjs updated November 2, 2005 and accessed on March 1, 2006

Bureau of Justice Statistics, Department of Justice (2006) "Corrections Statistics" Publication Number accessed at www.ojp.usdoj.gov/bjs updated January 17, 2006 and accessed on March 1, 2006

Campbell, AD. 1998. Kansas V Hendricks: Absent a Clear Meaning of Punishment, States are Permitted to Violate Double Jeopardy Clause. *Loyola University of Chicago Law Review* 30:87-131.

Carneiro P, Heckman, JJ, Masterov, DV. (2005) "Labor Market Discrimination and Racial Differences in Premarket Factors" *Journal of Law and Economics* 48(1): 1-39.

Caspi, A. et al. (1996). Behavioral observations at age 3 years predict adult psychiatric disorders: Longitudinal evidence from a birth cohort. *Archives of General Psychiatry* 53, 1033-1039.

Council of State Governments, Criminal Justice/Mental Health Consensus Project (New York: Council of State Governments June 2002) available at www.consensusproject.org (August 15, 2004)

Dee, T., & Evans, W. (2003). Teen Drinking and Educational Attainment: Evidence from Two-Sample Instrumental Variables Estimates. *Journal of Labor Economics*, 21(1), 178-209.

Deykin, E.Y. et al.. (1987). Adolescent depression, alcohol, and drug abuse. *American Journal of Public Health*, 77, 178-182.

Deykin, E.Y. et al.. (1992). Depressive illness among chemically dependent adolescents.

American Journal of Psychiatry, 149, 1341-1347.

DiNardo, J., & Lemieux, T. (2001). Alcohol, Marijuana, and American youth: the unintended consequences of government regulation. Journal of Health Economics, 20, 991-1010.

Ditton, Paula M. "Mental Health Treatment of Inmates and Probationers," *Bureau of Justice Statistics Special Report* (Washington, DC: U.S. Department Justice, Office of Justice Programs, July 1999)

Dovidio JF, Brigham, JC, Johnson BT, GAertner SL. (1996). Stereotyping, prejudice, and discrimination: Another look. In Macrae N, STangor C, and Hewstone M (eds), *Stereotypes and Stereotyping* (New York: Guilford): 276-319.

Duclos CW, Beals J, Novins DK, Martin C, Jewett CS (1998) Prevalence of Common Mental Health Disorders Among American Indian Adolescent Detainees. *Journal of the American Academy of Child and Adolescent Psychiatry*, 37:866-873.

Duclos CW. Beals J. Novins DK. Manson SM. Psychiatric disorders in detainees.[comment]. *Journal of the American Academy of Child & Adolescent Psychiatry.* 42(2):127, 2003 Feb

Fabrega H, Ulrich R and Loeber R (1996). Adolescent Psychopathology as a function of informant and risk status. *Journal of Nervous and Mental Disease.* 184: 27-34.

Farrelly, M., Bray, J., Zarkin, G., & Wendling, B. (2001). The joint demand for cigarettes and marijuana: evidence from the National Household Surveys on Drug Abuse. *Journal of Health Economics*, 20, 51-68.

Feldman, L., Harvey, B., Holowaty, P., & Shortt, L. (1999). Alcohol Use Beliefs and Behaviors Among High School Students. *Journal of Adolescent Health*, 24, 48-58.

Garland AF, Hough RL, McCabe KM, et al: Prevalence of psychiatric disorders in youths across five sectors of care. *Journal of the American Academy of Child and Adolescent Psychiatry* 40:409-418, 2001

Glied, Sherry, R. Moore, C. Hoven, A.B. Garrett, D. Regier. "Children's Access to Mental Health Care: Does Insurance Matter?" *Health Affairs*, 16(1) 1997: 167-174.

Guilamo-Ramos, V., Jaccard, J., Turrisi, R., & Johansson, M. (2005). Parental and School Correlates of Binge Drinking Among Middle School Students. American Journal of Public Health, 95(5), 894-899.

Guy E, Platt E, Zwerling I, and Bullock S: Mental health status of prisoners in an urban jail. *Criminal Justice and Behavior*. 1985;12(1): 29-53.

Henggeler, S. W. (1994). A consensus: Conclusions of the APA Task Force report on innovative models of mental health services for children, adolescents, and their families. *Journal of Clinical Child Psychology*,*23*(Suppl), 3-6.

Hochstedler, E, "Twice Cursed? The Mentally Disordered Criminal Defendant" *Criminal Justice and Behavior.* 1987;14(3): 251-267

Kandel DB. Johnson JG. Bird HR. Canino G. Goodman SH. Lahey BB. Regier DA. Schwab-Stone M. (1997). Psychiatric disorders associated with substance use among children and adolescents: findings from the Methods for the Epidemiology of Child and Adolescent Mental Disorders (MECA) Study. *Journal of Abnormal Child Psychology*. 25(2):121-32.

Kenkel, D., & Ribar, D. (1994). Alcohol Consumption and Young Adults' Socioeconomic Status. Brookings Papers in Economic Activity, 119-175.

Lundborg, P. (2002). Young People and Alcohol: And Econometric Analysis. Addiction, 97, 1573-1582.

Marmorstein N and Iacono W (2003). Major Depression and Conduct Disorder in a Twin Sample: Gender, Functioning and Risk for Future Psychopathology *Journal of the American Academy of Child and Adolescent Psychiatry* 42(2):225-233.

Neil, D and Johnson W (1996), "The Role of Premarket Factors in Black-White Wage Differences," *Journal of Political Economy* 104(5): 869-95.

Novak, KJ and Engle, RS (2005). "Disentangling the influence of suspects' demeanor and mental disorder on arrest," *Policing: An International Journal of Police Strategies and Management* 28(3):493-512

Office of Juvenile Justice and Delinquency Prevention, 2004. U.S. Department of Justice. *Juvenile Court Statistics, 2000.* Washington, DC: OJJDP, DOJ.

Peeples, F and Loeber R. 1994. Do Individual Factors and Neighborhood Context Explain Ethnic Differences in Juvenile Delinquency? *Journal of Quantitative Criminology* 10(2): 141-157

Powell TA, Holt JC, Fondacaro KM: The prevalence of mental illness among inmates in a rural state. *Law Hum Behav.* 1997; 21(4): 427-438.

Pulkkinen, L. & Pitkanen, T.. (1994). A prospective study of the precursors to problem drinking in young adulthood. *Journal of Studies on Alcohol*, 55, 578-87.

Rawal P, Romansky J, Jenuwine M, Lyons JS (2004). Racial Differences in the Mental Health Needs and Service Utilization of Youth in the Juvenile Justice System. *Journal of Behavioral Heath Services and Research* 31(3):242-254

Rees, D., Argys, L., & Averett, S. (2001). New Evidence on the Relationship Between Substance Use and Adolescent Sexual Behavior. *Journal of Health Economics*, 20, 835- 845.

Robins, LN and Regier DA. *Psychiatric Disorders in America: The Epidemiologic Catchment Area Study.* (New York: Free Press, 1991)

Shaffer, D., Fisher, P., Dulcan, M.K., Davies, M., Piacentini, J., Schwab-Stone, M.E., et al. (1996). The NIMH diagnostic interview schedule for children version 2.3 (DISC-2.3): Description, acceptability, prevalence rates, and performance in the MECA study. Methods for the epidemiology of child and adolescent mental disorders study. Journal of the American Academy of Child & Adolescent Psychiatry, 35(7), 865-77.

Swahn, M., Simon, T., Hamming, B., & Guerrero, J. (2004). Alcohol-consumption behaviors and risk for physical fighting and injuries among adolescent drinkers. Addictive Behaviors, 29, 959-963.

Swanson JW, Holzer CE, Ganju VK, et al: Violence and psychiatric disorder in the community: evidence from the epidemiologic catchment area surveys. Hospital and Community Psychiatry 41:761-770., 1990

Teplin LA. 1990. The prevalence of severe mental disorder among male urban jail detainees: comparison with the epidemiologic catchment area program. *Am J Public Health.* 80(6): 663-669.

Teplin, Linda A. 1984. Criminalizing Mental Disorder: The Comparative Arrest Rate of the Mentally Ill. *American Psychologist* vol. 39 (no. 7): 794-803.

Teplin LA, Abram KM, McClelland GM., et al (2002): Psychiatric disorders in youth in juvenile detention. *Archives of General Psychiatry* 59:1133-1143

Timmons-Mitchell J. Brown C. Schulz SC. Webster SE. Underwood LA. Semple WE. Spring 1997. Comparing the mental health needs of female and male incarcerated juvenile delinquents. *Behavioral Sciences & the Law. 15(2):195-202.*

U.S. Department of Health and Human Services. 1999. *Mental Health: A Report of the Surgeon General—Executive Summary, Chapter 3*. Rockville, MD: U.S. Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, Center for Mental Health Services, National Institutes of Health, National Institute of Mental Health.

Wasserman, G.A., McReynolds, L.S., Lucas, C.P., Fisher, P., Santos, L., (2002). The voice DISC-IV with incarcerated male youths: prevalence of disorder. *Journal of the American Academy of Child and Adolescent Psychiatry.* 41:314-321

Wexler, DB. 1983. The Structure of Civil Commitment: Patterns, Pressures, and Interactions with Mental Health Legislation. *Law and Human Behavior* 7:1-18.

Table 1: Total Gap in Justice Outcomes by Mental Disorder

Arrest Before Age 19	
All Youth (N=9,201)	5.2%
Males Only (N=4,235)	9.0%
Youth with ADHD (N=3,110)	7.6%
Youth without ADHD (N=6,091)	3.9%
Males with ADHD (N=1,752)	11.5%
Males without ADHD (N=2,483)	7.1%
Youth with Chronic Depression (N=3,335)	5.7%
Youth without Chronic Depression (N=5,866)	5.0%
Males with Chronic Depression (N=1,247)	10.9%
Males without Chronic Depression (N=2,988)	8.3%
Conviction Before Age 19	
All Youth (N=383)	44.5%
Males Only (N=317)	46.3%
Youth with ADHD (N=210)	50.6%
Youth without ADHD (N=173)	37.8%
Males with ADHD (N=187)	52.9%
Males without ADHD (N=130)	38.3%
Youth with Chronic Depression (N=158)	48.1%
Youth without Chronic Depression (N=225)	42.3%
Males with Chronic Depression (N=118)	52.2%
Males without Chronic Depression (N=199)	43.2%

Table 2: Descriptive Statistics, Mean Values

Variable	Full Sample (N=9,201)	Youth with ADHD (N=3,110)	Youth with Chronic Depression (N=3,335)
ADHD (binary indicator)	0.36	1.00	0.43
Chronic Depression (binary indicator)	0.35	0.42	1.00
Male	0.49	0.59	0.40
Other Demographics			
Age	15.72	15.72	15.95
	(0.10)	(0.11)	(0.10)
Black	0.16	0.14	0.19
Other NonWhite	0.18	0.17	0.19
Two Parent Household	0.68	0.65	0.63
Welfare	0.11	0.13	0.14
Mother, High School or less	0.56	0.60	0.59
Community Characteristics			
Urbanicity	0.51	0.51	0.52
	(0.04)	(0.04)	(0.04)
Ratio (Arrest/Reported Crimes)	0.21	0.21	0.21
	(0.01)	(0.01)	(0.01)
Percent of Households in Poverty	0.14	0.15	0.16
	(0.01)	(0.01)	(0.01)
Median Housing Value ($1000)	82.19	79.16	80.21
	(3.80)	(3.86)	(3.93)
Delinquent Behaviors			
Reported Delinquent Acts	2.63	3.01	3.36
	(0.06)	(0.09)	(0.09)
Theft (binary indicator)	0.12	0.16	0.18
Drug Sale/Possession (binary indicator)	0.12	0.17	0.18
Violent Acts	0.81	1.12	1.09
	(0.03)	(0.05)	(0.06)
Substance Use			
Alcohol Frequency	15.19	19.07	20.79
	(0.73)	(1.22)	(1.29)
Alcohol Binge Drinking (binary indicator)	0.08	0.11	0.12
Marijuana Frequency	1.93	2.55	2.83
	(0.25)	(0.41)	(0.36)
School			
School Absences	1.25	1.60	1.63
	(0.09)	(0.13)	(0.13)
Grade Point Average	2.8	2.6	2.7
	(0.2)	(0.3)	(0.2)
Parent Relationship			
Perceived Relationship (low is good)	8.50	8.61	9.00
	(0.06)	(0.09)	(0.09)
Parent Activities	2.64	2.62	2.77
	(0.03)	(0.04)	(0.04)
No resident mother (binary indicator)	0.04	0.06	0.05

Standard deviation in parentheses

Table 3: Juvenile Justice Outcomes: The ADHD Gap

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Panel A: Arrested before Age 19 – Logistic Model Coefficient (t statistic) [Marginal Effect]							
Full Sample (N = 9,201)	0.70	0.49	0.46	0.47	0.27	0.27	0.25	0.26
	(5.49)	(3.80)	(3.48)	(3.59)	(1.94)	(1.90)	(1.78)	(1.85)
	[.037]	[.019]	[.016]	[.016]	[.008]	[.007]	[.007]	[.007]
Males Only (N = 4,235)	0.53		0.50	0.51	0.31	0.31	0.30	0.30
	(3.75)		(3.50)	(3.58)	(2.06)	(2.03)	(1.94)	(2.02)
	[.044]		[.039]	[.039]	[.021]	[.021]	[.019]	[.020]
	Panel B: Convicted Conditional on Arrest prior to 18– Logistic Model Coefficient (t statistic) [Marginal Effect]							
Full Sample (N = 383)	0.51	0.47	0.47	0.65	0.52	0.50	0.58	0.56
	(2.05)	(1.82)	(1.81)	(2.55)	(1.82)	(1.62)	(1.85)	(1.85)
	[.126]	[.115]	[.117]	[.159]	[.126]	[.123]	[.141]	[.137]
Males (N =317)	0.54		0.54	0.71	0.58	0.56	0.68	0.63
	(2.00)		(2.00)	(2.65)	(1.99)	(1.72)	(2.00)	1.87
	[.133]		[.133]	[.175]	[.144]	[.138]	[.166]	[.155]
Gender		X	X	X	X	X	X	X
Other demographic characteristics			X	X	X	X	X	X
Community characteristics				X	X	X	X	X
Delinquent behaviors					X	X	X	X
Substance use						X	X	X
School Performance							X	X
Parent Relationship								X

Each cell shows the estimated coefficient of a binary indicator for ADHD symptoms and is from a separate regression. Parentheses contain *t* statistics and brackets contain the marginal effect. Other demographic characteristics include age, age squared, race/ethnicity, welfare receipt, mother's education, and family structure. Community characteristics include ratio of county arrests to reported crimes, percent of households in poverty by census tract, and median housing value by census tract. Delinquent behaviors include number of delinquent acts, and binary indicators for theft, drug sale or possession, and violence. Substance use includes alcohol frequency, binge drinking, and marijuana frequency. School absences include days missed in the past year without an excuse. Parent relationships include continuous measures of perceived parental relationship and number activities in the past four weeks. Details are provided in the text.

Table 4: Juvenile Justice Outcomes: The Depression Gap

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Panel A: Arrested before Age 19 – Logistic Model							
	Coefficient (*t* statistic) [Marginal Effect]							
Full Sample (N = 9,201)	0.13	0.20	0.32	0.36	0.29	0.32	0.19	0.09
	(0.53)	(0.85)	(1.43)	(1.50)	(1.15)	(1.12)	(0.67)	(0.31)
	[.007]	[.014]	[.013]	[.013]	[.0001]	[-.0003]	[-.0004]	[-.0006]
Males Only (N = 4,235)	0.30		0.28	0.29	-0.08	-0.09	-0.10	-0.10
	(1.91)		(1.72)	(1.85)	(0.45)	(0.52)	(0.57)	(0.59)
	[.026]		[.022]	[.023]	[-.005]	[-.006]	[-.006]	[-.006]
	Panel B: Convicted Conditional on Arrest prior to 18– Logistic Model							
	Coefficient (*t* statistic) [Marginal Effect]							
Full Sample (N = 383)	0.13	0.20	0.32	0.36	0.29	0.32	0.22	0.14
	(0.53)	(0.85)	(1.43)	(1.50)	(1.15)	(1.12)	(0.77)	(0.47)
	[.031]	[.050]	[.080]	[.089]	[.071]	[.079]	[.047]	[.021]
Males (N = 317)	0.21		0.36	0.43	0.34	0.39	0.26	0.19
	(0.78)		(1.37)	(1.51)	(1.13)	(1.11)	(0.71)	(0.51)
	[.053]		[.091]	[.107]	[.086]	[.098]	[.064]	[.047]
Gender		X	X	X	X	X	X	X
Other demographic characteristics			X	X	X	X	X	X
Community characteristics				X	X	X	X	X
Delinquent behaviors					X	X	X	X
Substance use						X	X	X
School Performance							X	X
Parent Relationship								X

Each cell shows the estimated coefficient of a binary indicator for chronic depression symptoms and is from a separate regression. Parentheses contain *t* statistics and brackets contain the marginal effect. Other demographic characteristics include age, age squared, race/ethnicity, welfare receipt, mother's education, and family structure. Community characteristics include ratio of county arrests to reported crimes, percent of households in poverty by census tract, and median housing value by census tract. Delinquent behaviors include number of delinquent acts, and binary indicators for theft, drug sale or possession, and violence. Substance use includes alcohol frequency, binge drinking, and marijuana frequency. School absences include days missed in the past year without an excuse. Parent relationships include continuous measures of perceived parental relationship and number activities in the past four weeks. Details are provided in the text.

Table 5: Decomposition of the Gap in Justice Outcomes

	Total Gap	Gap due to Observables	%
ADHD			
Probability of Arrest	3.7	2.5	67.6
Probability of Conviction	12.8	4.8	37.5
ADHD Males Only			
Probability of Arrest	4.4	2.2	50.0
Probability of Conviction	14.6	5.1	34.9
Depression			
Probability of Arrest	0.7	0.8	114.3
Probability of Conviction	5.8	4.1	70.7
Depression Males Only			
Probability of Arrest	2.6	3.3	126.9
Probability of Conviction	9.0	5.7	63.3

Appendix 1: Probability of Arrest Prior to Age 19: The ADHD Gap (N=9,201)

	Column1	Column2	Column3	Column4	Column5	Column6	Column7	Column8
ADHD	0.70	0.49	0.46	0.47	0.27	0.27	0.25	0.26
	(5.49)	(3.80)	(3.48)	(3.59)	(1.94)	(1.90)	(1.78)	(1.85)
Male		1.75	1.80	1.79	1.68	1.68	1.70	1.72
		(8.74)	(8.98)	(8.84)	(8.00)	(8.03)	(8.12)	(8.20)
Age			1.31	1.32	0.64	0.69	0.68	0.63
			(1.08)	(1.05)	(0.50)	(0.55)	(0.53)	(0.49)
Age^2			(0.05)	(0.05)	(0.03)	(0.03)	(0.03)	(0.03)
			(1.19)	(1.16)	(0.66)	(0.73)	(0.73)	(0.67)
Black			(0.05)	0.10	0.11	0.14	0.16	0.15
			(0.27)	(0.41)	(0.48)	(0.60)	(0.69)	(0.63)
OtherNonWhite			0.00	0.03	(0.10)	(0.10)	(0.11)	(0.11)
			(0.01)	(0.14)	(0.55)	(0.51)	(0.59)	(0.58)
Two Parent Household			(0.83)	(0.84)	(0.68)	(0.68)	(0.64)	(0.68)
			(5.71)	(5.81)	(4.24)	(4.20)	(3.94)	(4.10)
Welfare			0.22	0.30	0.30	0.28	0.24	0.21
			(1.04)	(1.36)	(1.23)	(1.13)	(0.99)	(0.84)
Mother, High School or less			(0.19)	(0.14)	(0.08)	(0.08)	(0.12)	(0.09)
			(1.30)	(0.97)	(0.57)	(0.53)	(0.85)	(0.56)
Urbanicity				0.09	0.03	0.04	0.05	0.05
				(0.54)	(0.20)	(0.23)	(0.27)	(0.27)
RatioArrests/CrimesReported				0.12	0.04	(0.03)	0.00	0.01
				(0.15)	(0.05)	(0.04)	(0.00)	(0.01)
Percent Poverty				(2.66)	(2.59)	(2.76)	(2.87)	(2.90)
				(1.20)	(1.19)	(1.27)	(1.30)	(1.29)
Percent Poverty^2				3.00	3.14	3.52	3.84	3.88
				(0.71)	(0.73)	(0.84)	(0.90)	(0.90)
Median Housing Value ($1000)				0.00	0.00	0.00	0.00	0.00
				(0.16)	(0.29)	(0.20)	(0.27)	(0.26)
Delinquent Acts					0.20	0.19	0.19	0.19
					(3.47)	(3.33)	(3.29)	(3.15)
Delinquent Acts^2					(0.01)	0.00	(0.01)	(0.01)
					(1.33)	(1.23)	(1.30)	(1.27)
Theft					0.06	0.04	0.02	0.02
					(0.50)	(0.28)	(0.14)	(0.15)
Drug Sale/Possession					0.32	0.24	0.23	0.23
					(2.39)	(1.71)	(1.66)	(1.65)
Violent Acts					0.12	0.10	0.10	0.10
					(2.48)	(1.93)	(1.88)	(1.92)
Alcohol Frequency						0.003	0.003	0.003
						(1.84)	(1.91)	(1.97)
Alcohol Binge						0.23	0.15	0.16
						(0.91)	(0.59)	(0.61)
Marijuana Frequency						0.00	0.00	0.00
						(0.08)	(0.14)	(0.15)

School Absences							0.04	0.04
							(2.76)	(2.73)
Parent Relationship								0.01
								(0.36)
Parent Activities								0.01
								(0.16)
No resident mother								(0.26)
								(0.67)
Constant	(3.20)	(4.30)	(12.74)	(12.66)	(7.58)	(7.80)	(7.59)	(7.31)
	(26.04)	(21.54)	(1.37)	(1.31)	(0.77)	(0.80)	(0.77)	(0.72)

t-statistics below coefficients

Appendix 2: Probability of Conviction: The ADHD Gap (N=383)

	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 8
ADHD	0.51	0.47	0.47	0.65	0.52	0.50	0.58	0.56
	(2.05)	(1.82)	(1.81)	(2.55)	(1.82)	(1.62)	(1.85)	(1.85)
Male		0.54	0.60	0.60	0.67	0.70	0.62	0.77
		(1.92)	(2.06)	(1.93)	(1.80)	(1.71)	(1.52)	(1.82)
Age			-2.03	-2.26	-2.95	-3.72	-3.79	-3.92
			(1.05)	(1.20)	(1.49)	(1.81)	(1.77)	(1.69)
Age^2			0.06	0.07	0.09	0.11	0.11	0.12
			(0.95)	(1.10)	(1.40)	(1.73)	(1.67)	(1.58)
Black			-0.19	-0.16	-0.29	-0.58	-0.46	-0.43
			(0.61)	(0.44)	(0.74)	(1.27)	(0.94)	(0.89)
Other NonWhite			0.12	0.26	0.27	0.15	0.22	0.35
			(0.37)	(0.72)	(0.72)	(0.37)	(0.55)	(0.83)
Two Parent Household			-0.37	-0.28	-0.39	-0.28	-0.26	-0.07
			(1.43)	(1.05)	(1.38)	(0.99)	(0.87)	(0.23)
Welfare			0.26	0.43	0.48	0.73	0.74	0.96
			(0.73)	(1.18)	(1.34)	(1.96)	(1.90)	(2.60)
Mother, High School or less			0.02	0.06	-0.04	-0.13	-0.27	-0.27
			(0.07)	(0.23)	(0.14)	(0.47)	(1.06)	(1.01)
Urbanicity				0.75	0.68	0.90	0.93	1.01
				(2.65)	(2.48)	(2.96)	(2.83)	(2.97)
RatioArrests/CrimesReported				1.77	1.02	1.28	1.26	1.83
				(1.00)	(0.57)	(0.67)	(0.62)	(0.80)
Percent Poverty				-11.81	-12.91	-13.20	-14.75	-16.01
				(3.10)	(3.36)	(3.36)	(3.51)	(3.60)
Percent Poverty^2				21.18	24.09	24.94	27.24	30.45
				(2.86)	(3.14)	(3.15)	(3.25)	(3.47)
Median Housing Value ($1000)				0.00	0.00	0.00	-0.01	-0.01
				(1.71)	(1.54)	(1.95)	(1.85)	(1.83)
Delinquent Acts					0.23	0.30	0.28	0.25
					(2.28)	(3.05)	(2.80)	(2.58)
Delinquent Acts^2					-0.02	-0.02	-0.02	-0.02
					(2.77)	(3.53)	(3.24)	(3.19)
Theft					0.36	0.50	0.39	0.53
					(1.82)	(2.56)	(2.06)	(2.67)
Drug Sale/Possession					-0.08	-0.19	-0.25	-0.26
					(0.43)	(0.93)	(1.22)	(1.31)
Violent Acts					0.09	0.12	0.11	0.09
					(1.06)	(1.40)	(1.26)	(1.03)
Alcohol Frequency						-0.01	-0.01	-0.01
						(1.88)	(1.96)	(2.06)
Alcohol Binge						0.36	0.21	0.27
						(0.97)	(0.55)	(0.70)
Marijuana Frequency						0.01	0.01	0.02

						(1.82)	(2.11)	(2.51)
School Absences							0.07	0.07
							(2.75)	(2.86)
Grade Point Average							-0.26	-0.29
							(1.42)	(1.61)
Parent Relationship								0.10
								(1.93)
Parent Activities								0.26
								(2.41)
No resident mother								1.68
								(2.41)
Constant	-0.46	-0.90	16.49	18.40	23.71	29.42	31.09	30.62
	(2.15)	(3.22)	(1.10)	(1.26)	(1.53)	(1.83)	(1.87)	(1.71)

t-statistics below coefficients

Appendix 3: Probability of Arrest Prior to Age 19: The Depression Gap (N=9,201)

	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 8
Chronic Depression	0.15	0.38	0.37	0.38	0.00	-0.01	-0.02	-0.02
	(1.04)	(2.82)	(2.71)	(2.83)	(0.03)	(0.08)	(0.11)	(0.17)
Male		1.87	1.92	1.91	1.71	1.71	1.73	1.74
		(9.68)	(9.87)	(9.72)	(8.42)	(8.46)	(8.56)	(8.65)
age			1.29	1.29	0.64	0.70	0.68	0.64
			(1.07)	(1.04)	(0.50)	(0.55)	(0.54)	(0.50)
Age^2			-0.05	-0.05	-0.03	-0.03	-0.03	-0.03
			(1.18)	(1.15)	(0.66)	(0.73)	(0.73)	(0.68)
Black			-0.12	0.04	0.09	0.12	0.14	0.13
			(0.60)	(0.16)	(0.37)	(0.50)	(0.60)	(0.56)
OtherNonWhite			-0.05	-0.01	-0.11	-0.10	-0.12	-0.12
			(0.27)	(0.08)	(0.60)	(0.55)	(0.63)	(0.62)
Two Parent Household			-0.84	-0.85	-0.69	-0.69	-0.65	-0.69
			(5.83)	(5.95)	(4.37)	(4.32)	(4.05)	(4.18)
Welfare			0.20	0.28	0.30	0.28	0.24	0.21
			(0.93)	(1.26)	(1.20)	(1.11)	(0.97)	(0.84)
Mother, High School or less			-0.17	-0.12	-0.08	-0.07	-0.12	-0.09
			(1.23)	(0.89)	(0.53)	(0.49)	(0.81)	(0.54)
Urbanicity				0.08	0.02	0.03	0.04	0.04
				(0.48)	(0.14)	(0.17)	(0.22)	(0.22)
RatioArrests/CrimesReported				0.12	0.07	-0.01	0.03	0.04
				(0.15)	(0.09)	(0.01)	(0.04)	(0.04)
Percent Poverty				-2.63	-2.59	-2.76	-2.86	-2.88
				(1.18)	(1.19)	(1.27)	(1.30)	(1.29)
Percent Poverty^2				2.75	3.11	3.49	3.81	3.85
				(0.65)	(0.73)	(0.84)	(0.90)	(0.90)
Median Housing Value ($1000)				0.00	0.00	0.00	0.00	0.00
				(0.09)	(0.30)	(0.22)	(0.28)	(0.27)
Delinquent Acts					0.21	0.20	0.20	0.19
					(3.59)	(3.46)	(3.41)	(3.29)
Delinquent Acts^2					-0.01	-0.01	-0.01	-0.01
					(1.43)	(1.33)	(1.40)	(1.38)
Theft					0.06	0.04	0.02	0.02
					(0.50)	(0.27)	(0.13)	(0.14)
Drug Sale/Possession					0.32	0.25	0.23	0.23
					(2.43)	(1.74)	(1.68)	(1.67)
Violent Acts					0.13	0.11	0.10	0.11
					(2.66)	(2.10)	(2.03)	(2.08)
Alcohol Frequency						0.003	0.003	0.003
						(1.78)	(1.86)	(1.92)
Alcohol Binge						0.25	0.17	0.17
						(0.95)	(0.63)	(0.65)
Marijuana Frequency						0.00	0.00	0.00

						(0.07)	(0.12)	(0.12)
School Absences							0.04	0.04
							(2.89)	(2.85)
Parent Relationship								0.01
								(0.42)
Parent Activities								0.01
								(0.17)
No resident mother								-0.23
								(0.57)
Constant	-2.95	-4.30	-12.48	-12.32	-7.48	-7.77	-7.56	-7.32
	(27.24)	(23.91)	(1.35)	(1.28)	(0.76)	(0.80)	(0.77)	(0.73)

t-statistics below coefficients

Appendix 4: Probability of Conviction: The Depression Gap (N=383)

	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 8
Depression	0.13	0.20	0.32	0.36	0.29	0.32	0.19	0.09
	(0.53)	(0.85)	(1.43)	(1.50)	(1.15)	(1.12)	(0.66)	(0.30)
Male		0.66	0.75	0.79	0.82	0.88	0.78	0.88
		(2.39)	(2.58)	(2.47)	(2.16)	(2.16)	(1.89)	(2.06)
Age			-2.13	-2.38	-3.10	-3.81	-3.75	-3.83
			(1.14)	(1.28)	(1.56)	(1.83)	(1.76)	(1.68)
Age^2			0.06	0.07	0.09	0.11	0.11	0.11
			(1.03)	(1.17)	(1.47)	(1.74)	(1.66)	(1.56)
Black			-0.27	-0.24	-0.36	-0.66	-0.54	-0.52
			(0.82)	(0.64)	(0.93)	(1.42)	(1.14)	(1.09)
Other NonWhite			0.11	0.28	0.28	0.14	0.2	0.31
			(0.36)	(0.80)	(0.75)	(0.36)	(0.50)	(0.74)
Two Parent Household			-0.36	-0.26	-0.39	-0.28	-0.26	-0.06
			(1.35)	(0.97)	(1.38)	(0.97)	(0.88)	(0.20)
Welfare			0.29	0.45	0.50	0.73	0.71	0.94
			(0.80)	(1.24)	(1.40)	(1.97)	(1.86)	(2.52)
Mother, High School or less			0.06	0.11	-0.02	-0.11	-0.25	-0.3
			(0.22)	(0.42)	(0.06)	(0.41)	(0.98)	(1.12)
Urbanicity				0.63	0.60	0.85	0.87	0.96
				(2.17)	(2.11)	(2.77)	(2.64)	(2.83)
RatioArrests/CrimesReported				1.52	0.78	1.10	1.17	1.68
				(0.80)	(0.41)	(0.55)	(0.55)	(0.71)
Percent Poverty				-11.19	-12.53	-13.01	-14.38	-15.61
				(2.91)	(3.29)	(3.27)	(3.44)	(3.52)
Percent Poverty^2				19.79	23.28	24.55	26.75	30.05
				(2.64)	(3.06)	(3.11)	(3.30)	(3.53)
Median Housing Value ($1000)				0.00	0.00	0.00	-0.01	-0.01
				(1.60)	(1.44)	(1.81)	(1.74)	(1.69)
Delinquent Acts					0.24	0.31	0.29	0.27
					(2.49)	(3.21)	(3.05)	(2.82)
Delinquent Acts^2					-0.02	-0.02	-0.02	-0.02
					(3.09)	(3.77)	(3.57)	(3.55)
Theft					0.37	0.52	0.42	0.55
					(1.89)	(2.73)	(2.25)	(2.80)
Drug Sale/Possession					-0.12	-0.25	-0.3	-0.3
					(0.70)	(1.32)	(1.50)	(1.61)
Violent Acts					0.11	0.14	0.14	0.12
					(1.24)	(1.60)	(1.58)	(1.42)
Alcohol Frequency						-0.01	-0.01	-0.01
						(1.63)	(1.68)	(1.78)
Alcohol Binge						0.30	0.17	0.24
						(0.81)	(0.47)	(0.63)
Marijuana Frequency						0.01	0.01	0.02
						(1.75)	(2.06)	(2.48)

School Absences							0.07	0.07
							(2.57)	(2.75)
Grade Point Average							-0.23	-0.27
							(1.24)	(1.49)
Parent Relationship								0.09
								(1.83)
Parent Activities								0.25
								(2.26)
No resident mother	-0.24	-0.83	17.34	19.55	25.03	30.29		1.83
	(1.45)	(3.15)	(1.20)	(1.35)	(1.61)	(1.86)		(2.76)
Constant	0.13	0.20	0.32	0.36	0.29	0.32	30.89	30.14
	(0.53)	(0.85)	(1.43)	(1.50)	(1.15)	(1.12)	(1.87)	(1.70)

t-statistics below coefficients